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ABSTRACT

The linear relationship between intellectual commitment to running and psychobiological dependence upon running is examined. A sample of 540 regular runners (running frequency greater than three days per week for the past year for the majority) was surveyed with a questionnaire. Measures of commitment and dependence on running, as well as demographic information, were obtained. Dependence scores were found to be normally distributed, although scores tended toward the more dependent end of the continuum. (JD)

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COMMITMENT AND DEPENDENCE UPON REGULAR RUNNING[1,2]

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Abstract

Current running popularity has spurred millions of individuals to the roads, tracks and trails in search of the alleged benefits espoused by running's advocates. Recent attention has focused on the 'addicting' properties of the running experience, prompting use of the terms 'running addict' and 'exercise addict.'

The relatively simplistic view of a linear relationship between intellectual commitment to running and psychobiological dependence upon running was examined. A sample of 540 regular runners (running frequency greater than three days per week for the past 12 months for the majority of runners) was surveyed with a questionnaire. Measures of commitment and dependence upon running, as well as demographic information, were obtained. It was hypothesized that runners could be categorized within a model employing a quadrant system, with commitment to running on one axis and dependence upon running on the other. For example, evidence suggests that not all committed runners are dependent upon participation, although this is implied in the popular literature.

The sample of regular runners included 368 males and 172 females. The runners ran an average of 4.9 days per week for the past two months (an increase over the average of 4.4 days per week for the past 12 months), for an average of 4.51 miles per day. Dependence scores were normally distributed, although scores tended towards the more

dependent end of the continuum (mean score = 47.7, possible range is 12 to 60, with 12 indicative of a low level of dependence and 60 indicative of a high level of dependence). Level of commitment was positively correlated with level of dependence. Results indicated some support for the categorization of runners within the proposed model, and further suggest the need to consider different ways of clarifying motivation for participation in running.

Recent estimates indicate that 25 million people in this country run as a means of exercise, a 200% gain in four years (Moore, 1979). However, this increment in exercise participation is not restricted to running, with twice as many tennis players as five years ago (40 million in all), and large increases in the number of cyclists and swimmers, among other sports (Moore, 1979). Indeed, our roads, tracks, fields, courts, swimming pools, and gymnasia appear to be continually filled with exercise participants.

These increases have been accompanied by heightened interest on behalf of laypersons as well as scientists in psychological considerations underlying exercise participation, particularly running. Some areas of investigation have been of particular interest to researchers, including personality, the use of running as psychotherapy, and the regularity and intensity of participation in physical activity which may encourage use of the term 'exercise dependence' (exercise addiction).

The negative connotations elicited by the term 'addiction' (Lilliefors, 1978) prompt use of the term 'dependence' with respect to exercise. Although the term exercise addiction remains in popular use (Glasser, 1976, 1978; Kane, 1978; Sachs & Pargman, note 4; Wilmore, 1978), the term exercise dependence will be used herein.

However, research in exercise dependence has been of relatively limited scope, primarily because of difficulty in soliciting participants for research who are willing to

stop exercising for extended periods of time, as Baekeland (1970) indicates:

> While it had been easy to obtain Ss for our first exercise study, it proved very hard to find Ss who exercised regularly and yet were willing to deprive themselves of exercise for a month. The Ss finally used differed in at least two ways from those we had previously studied. First of all, they were much harder to recruit. Notwithstanding the fact that they were being offered higher pay than usual, many prospective Ss (especially those who exercised daily) asserted that they would not stop exercising for any amount of money. Secondly, those who were willing to participate exercised somewhat less frequently (three to four days a week) and strenuously than the Ss we had previously studied, who had exercised five to six days a week. However, all Ss exercised regularly at least three times a week. They seemed to view the anticipated period without exercise not simply as one of exercise restriction but rather as one of exercise deprivation. (p. 265)

Such problems make research efforts difficult, and there remain numerous important, unanswered questions in relation to the running experience. One of these questions concerns motivation for participation in running. In this study, runners were queried about various aspects of their running, in order to assess support for an hypothesized model which

attempts to clarify motives for participation in this activity.

Dependence upon exercise

Pargman and others (Burgess, 1976; Pargman & Burgess, note 2; Sachs & Pargman, note 4) have conducted a number of research studies on exercise dependence. Burgess (1976) tested the hypothesis that stimulus-seeking and extraversion were factors underlying addiction to exercise (exercise dependence). Regular (five days per week, for more than two years), occasional (two to three days per week), and nonexercisers were tested with the Stimulus Variation Seeking Scale, the Sensation Seeking Scale (SSS), and the Eysenck Personality Inventory (EPI). Regular and occasional exercisers were found to have scored significantly higher on the Thrill and Adventure Seeking Scale of the SSS, and lower on the Neuroticism Scale of the EPI than nonexercisers.

Pargman and Burgess (note 2) have suggested a psychobiological explanation of dependence upon exercise. They emphasize the importance of considering both psychological and biological factors in understanding exercise dependence. Their psychosomatic approach is not a new one, but has received less attention than it deserves in the exercise and sport sciences. This is most likely due to the relatively greater ease of investigating psychological or biological aspects, rather than both. Alexander and Selesnick (1966) note the complexity of man both as a physiological organism and as a cognitively, verbally oriented being, and suggest that he should be studied psychologically and physiologically at the same time.

While it appears that psychological factors may be predominant in dependence upon exercise (Carmack & Martens, note 1; Sachs & Pargman, note 4), there are indications that biological factors are critical to an understanding of exercise dependence (Glasser, 1978; Johnson, 1978; Snyder, 1977a, 1977b).

The depth interview approach was used by Sachs and Pargman (note 4) in an examination of 12 runners at varying stages of dependence upon exercise. A broad range of questions was included in the interview, dealing with reasons for running, roles as a runner, the importance of running, motivational considerations, as well as exercise dependence. There were more similarities than dissimilarities in the responses of the runners to the series of questions. Enough differences were manifest, however, to suggest that although a general psychological description of the exercise dependent individual might be feasible, considerable variability exists in individual attributes which tends to impede sweeping generalizations.

The reasons for beginning participation were varied, and included influences from other individuals, concerns of general health, improvement of cardiovascular fitness (getting in shape), and body weight reduction. These reasons continued to be present as the running programs of the participants were maintained, but additional psychological considerations such as feeling better, relaxing, and getting away from things became prevalent. Running became a significant part of the participants' lives, with other activities

and leisure pursuits structured around the total commitment to running.

A definition of exercise dependence (exercise addiction) has been proposed by Sachs and Pargman (note 4): addiction, of a psychological and/or physiological nature, upon a regular regimen of physical activity, characterized by withdrawal symptoms after 24-36 hours without exercise. The withdrawal symptoms appear to be critical in the determination of the degree of dependence upon exercise. Feelings of anxiety, restlessness, discomfort, and irritation were among those symptoms mentioned by the runners as reactions to periods of time when participation was not possible. Most of the runners felt themselves to be dependent upon running. It appeared that exercise dependence required at least four to five months to develop, but further research is needed to specify the precise qualitative and quantitative characteristics of the development of dependence upon exercise.

Recently, Carmack and Martens (note 1) attempted to develop and validate a scale to measure "Commitment to Running," which is synonymous with the term 'exercise dependence' used herein. Questionnaires eliciting information concerning demographics, attitudes toward running, mental states during a run, and perceived outcomes of running were received from 315 runners (250 males, 65 females). The reliability (.93), internal consistency (.97), and concurrent validity of the 12 item "Commitment to Running" scale were obtained.

Significant differences on level of commitment to running (CR) were found on a number of variables, with those runners scoring higher on CR experiencing greater discomfort when a run was missed. These runners also indicated a higher level of perceived addiction to running, and ran for longer periods of time (length of run). Two of these variables, perceived addiction and length of run (as well as a third, state of mind), were found, through regression analysis, to be predictors of commitment to running.

Reasons for participation in programs of regular running were found to fall into eight general categories: physical health, psychological health, affiliation, goal achievement, tangible rewards, other's influence, availability, and miscellaneous. There was a trend for runners scoring high on CR to give reasons in the psychological category for adherence to participation. This finding jibes with that obtained by Sachs and Pargman (note 4).

Five categories were obtained for responses to a list of perceived outcomes of running: physical health, psychological uplift, self-image, affiliation, and achievement. Runners scoring high on CR responded positively to significantly more items in all five of these categories than runners scoring low on CR. It is notable that the proportion of positive responses for the high CR scorers was greatest for the category of psychological health.

The Carmack and Martens "Commitment to Running" scale appears to have considerable potential for use in research

on exercise dependence. Their findings are important in outlining future research directions in this area, particularly in the formulation of questions related to the development and maintenance of dependence upon exercise.

Discussion of exercise dependence is notable in the popular literature, wherein other terms have been used to describe dependence, e.g., 'compulsion,' (Abell, 1975) and 'positive addiction' (Glasser, 1976). Glasser's work is essentially an examination of addictions which he views as supportive of the addict's psychology and physiology. Positive addictions, such as running and meditation, are thought to provide psychological strength and increase the satisfaction derived from life. This is in sharp contrast to common, or negative, addictions such as to alcohol or heroin, which weaken and often undermine the psychological and physiological integrity of an individual. The thesis of Glasser's work is that: "Many people, weak and strong, can help themselves to be stronger, and an important new path to strength may be positive addiction." (p. 11)

While Glasser's work is not scientifically based in the sense of rigorous experimental design and statistical analysis, useful clinical and psychiatric assessments are included. A general feeling of 'high' or euphoria experienced by regular runners is reported. Classic descriptions of the positive addiction state include a loss of the sense of oneself, floating, euphoria, and a total integration with running. Glasser recommends running for anyone, both psychologically strong and weak, who desires a positively

addicting activity.

The concept of exercise dependence (exercise addiction) has also been addressed in 'non-scientific' sources. Fixx (1977), Henderson (1974), and Sheehan (1975, 1978) have published popular books about running which include treatment of psychological factors. Articles designed for consumption by runners themselves frequently appear in publications ranging from Runner's World to The New York Times (Abell, 1975; Albin, 1978; Carpenter, 1978; Cohen, 1977; Fixx, 1978; Harris, 1978; Human Behavior, 1978; Johnson, 1978; Leahy, 1977; Robinson, 1978). Discussion of exercise dependence has also encompassed activities other than running, including tennis (Stillman, 1977) and rowing (Tuite, 1978).

The Model

Examination of motivations for running in regular runners reveals that not all such individuals are as 'addicted' as suggested in the literature (Sachs & Pargman, note 4). Perhaps many individuals participate regularly for reasons other than the compelling psychological and physiological forces allegedly inherent in the endurance run.

In this study an attempt was made to test the efficacy of an hypothesized model proposed as a clarifier of motivation for participation in running. Two axes are conceptualized; one indicating degree of dependence (psychobiologic), and the other degree of commitment (primarily cognitive-intellectual). Thus it is speculated that motivation for participation in running is best examined through a two factor, rather than a unidimensional, model.

Commitment to running may be viewed as a multifaceted phenomenon, in that numerous social, psychological, and physiological factors appear to underlie involvement in this activity. Time spent thinking and reading about running; distance involved in traveling to races and frequency of competition; money spent on books and magazines about running and on equipment and accessories; changes in eating, drinking, sleeping, and other lifestyle patterns in order to accomodate the daily run; and the duration and intensity of running itself are all variable aspects of individual participation in running.

Dependence upon running is defined as dependence, of a psychological and/or physiological nature, characterized by withdrawal symptoms after a period of time without participation. Reported withdrawal symptoms include tension, guilt, anxiety, nervousness, irritability, feelings of bloatedness, and muscle twitching. This phenomenon has also been termed 'exercise addiction.' However, as previously noted, in part because of the negative connotations associated with the term 'addiction,' the term 'dependence' is suggested as being preferable.

Insert Figure 1 about here

The model of participation in running is presented in Figure 1. Four quadrants are proposed in an examination of the relationship of commitment to dependence in endurance

running. Each quadrant is hypothesized to categorize a different 'type' of runner.

The truly addicted exerciser, as described in the literature, is to be found in quadrant A, and is characterized by high levels of both commitment and dependence. Such an individual's lifestyle is centered around regular (usually daily) running, and motivational factors have progressed beyond interest in keeping in shape or reducing stored body fat. Persons located in quadrant A are in quest of psychological well-being through running, as well as the avoidance of withdrawal symptoms manifest during periods of nonparticipation.

An individual who is dependent upon running, but not committed to regular participation, would be located in quadrant B. Whereas social-environmental agents such as family, work or school may take priority and impede maintenance of a regular running schedule, dependence upon running is still characteristic of individuals categorized in this quadrant.

Quadrant C contains the occasional runner, the individual characterized by low levels of commitment and dependence. This person may feel occasional twinges of guilt if participation is not possible, but does not suffer the relatively acute withdrawal symptoms experienced by the highly dependent person. Quadrant C runners participate occasionally, with convenience and the absence of other physical activity options dictating the frequency of participation.

The individual in quadrant D is deserving of special attention because, to date, little in the literature acknowledges such a person. This type of runner is highly committed to running, but is not dependent upon participation. It is possible that, due to the absence of a number of Glasser's (1976) conditions for the development of a positive addiction, dependence upon participation has not yet developed.

Most runners begin running for health, weight reduction, or social reasons (Sachs & Pargman, note 4), but the dependent runner continues because of the perceived psychological benefits derived from participation. These benefits reportedly include: feeling better after a run, experiencing the 'runner's high' during the run, and avoidance of withdrawal symptoms manifest during periods of nonparticipation.

However, the quadrant D runner does not progress to this stage, but remains committed for the health and social reasons that may have served as motivating factors initially. One runner might run regularly to forestall the possibility of a heart attack, due to a history of heart attacks in his family. Another runner might run regularly because his/her boss, girlfriend or boyfriend, runs, and he/she participates for the reinforcement derived from these significant others, rather than from running.

Quadrant D runners, therefore, do not run because of opportunities for mind bending experiences, escape from depression, or euphoria, but for other reasons. These include health and social factors indicated above, money

(athletes on scholarship, professionals), prestige, power, and narcissism.

The proposed model of commitment and dependence is a dynamic one, with potential movement through its quadrants. However, such movement does not occur freely. Indeed, there appear to be patterned directions for change of location within the model, as illustrated in Figure 2.

Insert Figure 2 about here

All individuals begin in quadrant C, at low levels of commitment and dependence. Before dependence can increase, commitment must increase, generally through an increase in the number of days per week in which participation occurs. Therefore, movement from quadrant C can be only to quadrant D.

Movement from quadrant D may be either to quadrants A or C. As commitment remains high, dependence upon running may develop. As dependence increases, the individual moves toward (into) quadrant A, while keeping commitment high. If commitment decreases, for whatever reason, movement is towards quadrant C, with a low level of dependence remaining constant but commitment decreasing from high to low.

Movement from quadrant A can be only to quadrant B. Dependence will not decrease unless commitment first decreases, precipitating the onset of withdrawal symptoms. As commitment decreases, the individual moves toward (into) quadrant B.

The individual in quadrant B will, within a matter of days or weeks, evidence a decrease in level of dependence and move toward quadrant C. At this point there are two possibilities for movement. Commitment can remain constant (low), and dependence will continue to decrease and movement into quadrant C will occur. Commitment can be increased, however, in which case the individual would return to quadrant A.

Despite the model's dynamic quality, which permits movement through its quadrants, position in quadrants A, C and D would tend to remain stable, unless changes in motivation, with concomitant shifts in level of commitment, or adherence to the steps necessary for the development of addiction (Glasser, 1976) occurs. Position in quadrant B tends to be basically unstable, since low levels of commitment would not appear to be associated with high levels of dependence for a period longer than a few days or weeks. If movement does occur within the model, it would take the form(s) indicated earlier.

What is the value of making these distinctions and developing this model for participation in running? First, the myriad of psychological benefits suggested for running in both the popular and research literatures indicates a need to better understand the psychology of running. While the possibility exists that the current running 'craze' is only a fad and will soon dissipate, it is likely to continue in the near future. Therefore, there exists a phenomenon that is becoming relatively pervasive in some segments of society, but which has been examined through a few research studies

with little theoretical rationale or direction.

Second, counseling programs may be designed for work with individuals in different areas of the model, such as in the development of motivation to initiate, increase, maintain, or decrease commitment to running. Running has been suggested as a viable adjunct to psychotherapy, and initiating participation and facilitating adherence to physical activity are critical factors (see Sachs, note 3). Additional factors of importance include the facilitation, maintenance, or reduction (see Glasser, 1976; Morgan, 1979a, 1979b) of dependence, and the enhancement of psychological benefits obtained from running.

The question to be addressed in this study concerns the viability of the proposed model; that is to say, does the model accurately represent participation in running for regular runners? While 25 million people claim to be runners (Moore, 1979), this figure most likely includes many individuals who run only occasionally. In this paper, particular concern is aimed at the individual who runs regularly, i.e., the person who runs three or more days per week. This commitment, assuming adequate time is spent running (at least 15 minutes), is the recommended level of participation for improving and maintaining cardiovascular fitness (American College of Sports Medicine, 1978).

Carmack and Martens (note 1) have provided a reliable and valid scale for the measurement of dependence upon running. Given the logistics of attempting to obtain data from a large

group of individuals, the 12 item scale developed by Carmack and Martens appeared eminently suitable for this investigation.

The average number of days per week that a person ran was used as the measure of commitment to running. Although commitment to running may be considered as a very complex factor, no valid measures of cognitive/intellectual commitment to running are available. It was felt that a person could be said to have made a commitment to running if he ran on a regular basis (at least three times per week).

Methods

Participants

Questionnaires were distributed to 1028 runners in Tallahassee, Florida and surrounding areas. The distribution of the questionnaires was as follows: 300 mailed to members of the Gulf Winds Track Club (Tallahassee, Florida); 350 mailed to participants in the Blue Crab Festival 5000 meter race in Panacea, Florida; 45 distributed to customers at the Athletic Attic store, Tallahassee Mall, Tallahassee, Florida; 45 distributed to runners at the Amos P. Godby High School track, Tallahassee, Florida; 250 distributed to runners at the Florida State University track, Tallahassee, Florida; and 38 distributed to friends and colleagues. The mailed questionnaires were sent at the end of August and beginning of September, 1978. The questionnaires that were hand distributed were given at the end of September and beginning of October, 1978.

Procedure

Each questionnaire was accompanied by a stamped, self-

addressed envelope and enclosed in an envelope which was either mailed or given to the participants. A cover sheet provided an explanation of the purpose of the study and requested participants to return the attached questionnaire.

The questionnaire consisted of three sections. The first requested general information concerning the participant, including gender, age, occupation, marital status, and level of education. The second section asked for running information, including frequency and duration of participation during the past 12 and two month periods. The final section was a 'feelings about running' scale, the "Commitment to Running" scale developed by Carmack and Martens (note 1). Possible range of scores on the scale is 12 to 60, with 12 indicative of a low level of commitment to running and 60 indicative of a high level of commitment to running (note that commitment is interpreted as dependence in this study).

Results and Discussion

Completed questionnaires were received from 650 runners, a return rate of 63%. While this percentage is encouraging, the feeling still persists that a higher return rate might be expected due to the brevity of the questionnaire, the ease of returning the questionnaire by mail to the investigator, and the presumed ego-involvement of the participants in the activity of running. Indeed, virtually all runners at the tracks indicated they would be 'happy' to complete and return the questionnaires. This level of intention apparently diminished with distance from the investigator and the track, and the return rate for these individuals was

approximately equal to that for the overall sample.

Unfortunately, due to errors in completing the questionnaires, 75 were unable to be used in the statistical analyses. Of the 575 remaining questionnaires, 35 were from runners who could not be defined as regular runners for the past two months. These individuals were therefore excluded from the final analyses. The total number of runners from whom usable questionnaires were received and who could be categorized as regular runners was 540 individuals. The mean age of these participants was 29.6 years, with a range of 14 to 60 years of age. There were 368 males, 171 females, and one individual who declined to identify him/herself. Two 'occupational' categories were particularly prominent, with 87 runners (16.1%) being undergraduate students, and 62 individuals (11.5%) categorized as state employees.

With regard to the marital status of the runners, 275 (50.9%) were married, 225 (41.7%) were single, and 38 (7%) were divorced. Of the 151 runners who had children, most had one (54 for 36%) or two children (57 for 38%), although three individuals (2%) did indicate having five children.

The majority of individuals had completed college, with many participants having advanced degrees. There were 186 runners (34.4%) who had finished college only, 123 (22.8%) who had completed master's degrees, and 36 (6.7%) who had completed Ph.D. degrees. Additionally, 3[illegible] (5.6%) of the runners had received their J.D. degrees.

Participants were asked to indicate the frequency and

duration of participation in running during the past 12 and two month periods. The runners ran an average of 4.36 days per week during the past 12 months, and significantly increased this to an average of 4.92 days per week for the past two months (t=9.72, df=479, $\alpha < .05$). A similar significant increase (t=8.61, df=435, $\alpha < .05$) was noted in the number of minutes per run, increasing from an average of 32.00 minutes for the past 12 months to an average of 37.83 minutes per run. Mileage completed per run also increased significantly, from 3.73 miles per run for the past 12 months to 4.51 miles per run for the past two months (t=9.74, df=461, $\alpha < .05$). These figures suggest that many of the runners were still (and perhaps still are) at the developmental stage of their running 'careers' in increasing their time and distance run. This is particularly noteworthy in that the two month period for most of the runners was during part of the summer, generally a very difficult time of year to run in Tallahassee due to excessive levels of heat and humidity.

The mean total dependence score of the 'feelings about running' scale was 47.72 (σ = 6.33), with a range of 24 (one case) to 60 (10 cases). These results compare favorably with those of Carmack and Martens (note 1), who found means of 48.3 and 45.7 for their male and female participants, respectively. Indeed, the mean total dependence score for the males in this study was 48.15, and 46.81 for the females, quite similar to the Carmack and Martens results.

Although results indicate that the total dependence

score was significantly correlated (at the .001 level) with frequency and duration of participation (minutes and miles per run for the past 12 and two months), the magnitude of the correlations was quite modest. This suggests a degree of independence of the two axes, commitment and dependence upon running.

Insert Figure 3 about here

Figure 3 provides a graphic display of the relationship between total dependence score and average days per week run in the past 12 months for regular runners, plus individuals for whom dependence scores were obtained but who ran only one or two days per week (Numbers on graph indicate number of participants at that point; * indicates one individual). It can readily be seen that there is considerable variability in scores on both commitment and dependence upon running. The viability of the model appears to be supported, although most of the participants would be categorized as quadrant A or B runners, as described earlier.

Two points must be considered. First, most of the data are skewed toward the right side of the model, indicative of relatively high dependence scores. Although the scale of the model extends from 12 to 60 (corresponding with the 'feelings about running' scale), it seems likely that some form of social desirability may be present in participants' responses. For the individual to participate in running in the first place, there is probably some degree of positive affect towards the activity. Additionally, regardless of their

'true' feelings, participants may be unlikely to indicate, even anonymously, that they really strongly dislike running, presumably a socially desirable activity in which to engage. The effective range of scores on the scale may therefore be from the high 20's to 60, which would be more supportive of the model.

Second, sampling considerations may have biased the data towards those individuals high in total dependence score. Very few quadrant D individuals may have been sampled. Anecdotal evidence suggests that many runners in Tallahassee participate regularly, even daily, near their homes in various areas of the city, but do not participate in races, run at the track, or belong to the local track club. While it is comparatively easy to sample runners in the track club, at races or the local track, it is quite difficult to obtain individuals who only run in their neighborhoods, frequently early in the morning or after work. It might therefore be suggested that the data are characteristic of one segment of runners in Tallahassee, but that a sizable contingent of runners whose characteristics may differ from those tested in this study may have been excluded.

With development and refinement of measuring instruments, and further research into practical applications of commitment and dependence upon running, a clearer understanding of the nature of motivation for participation may be obtained.

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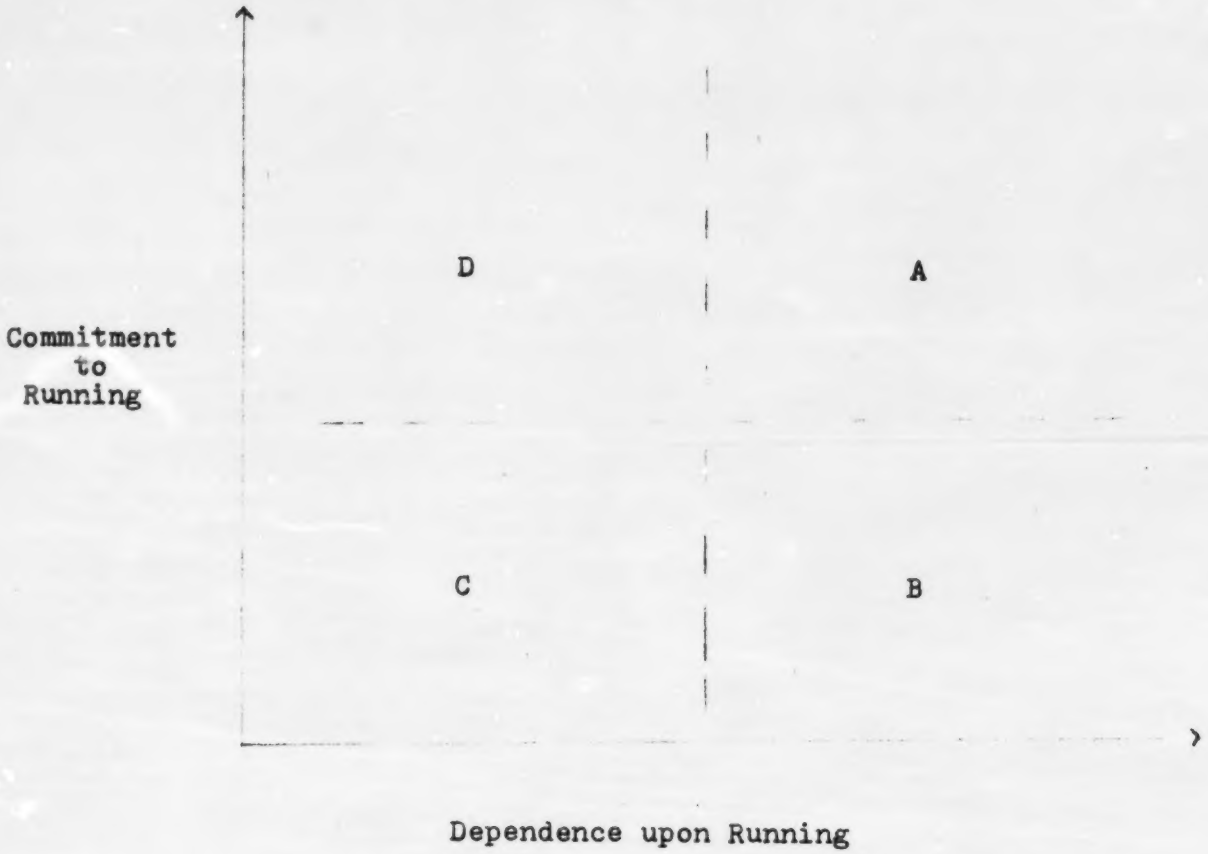

Figure 1. Model of participation in running.

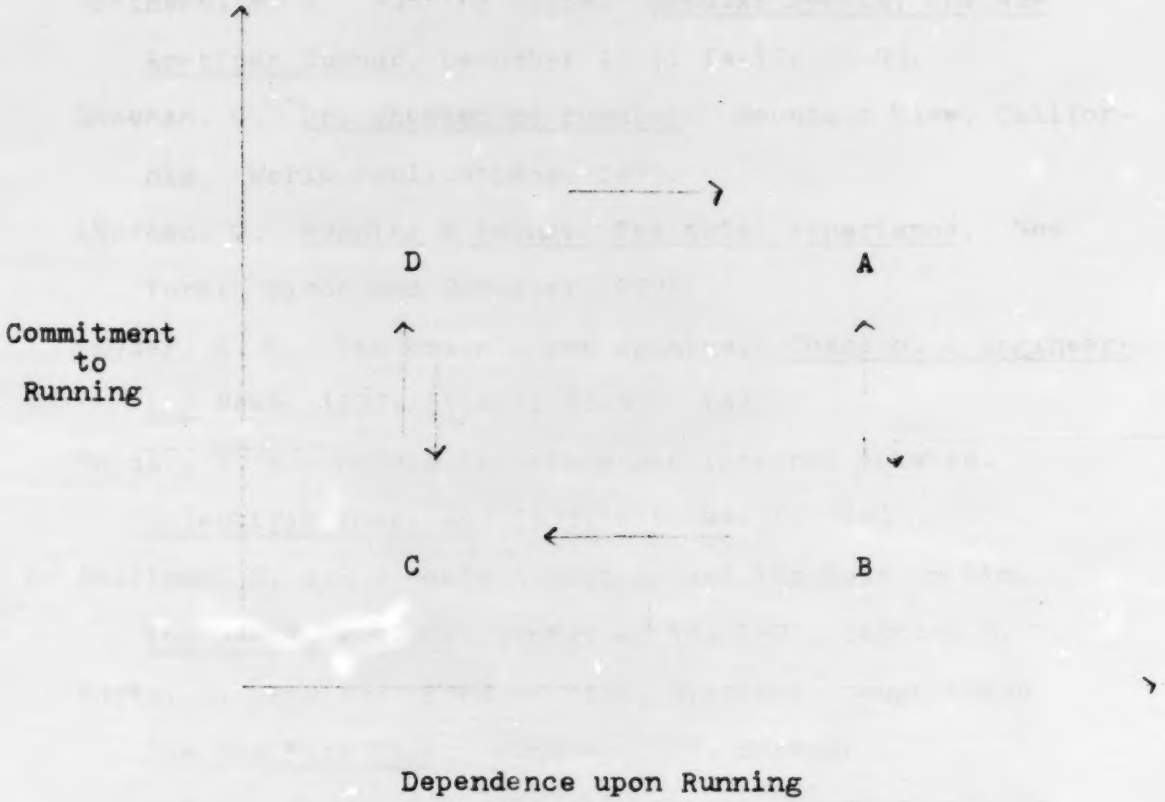

Figure 2. Potential patterns of movement through the model of participation in running.

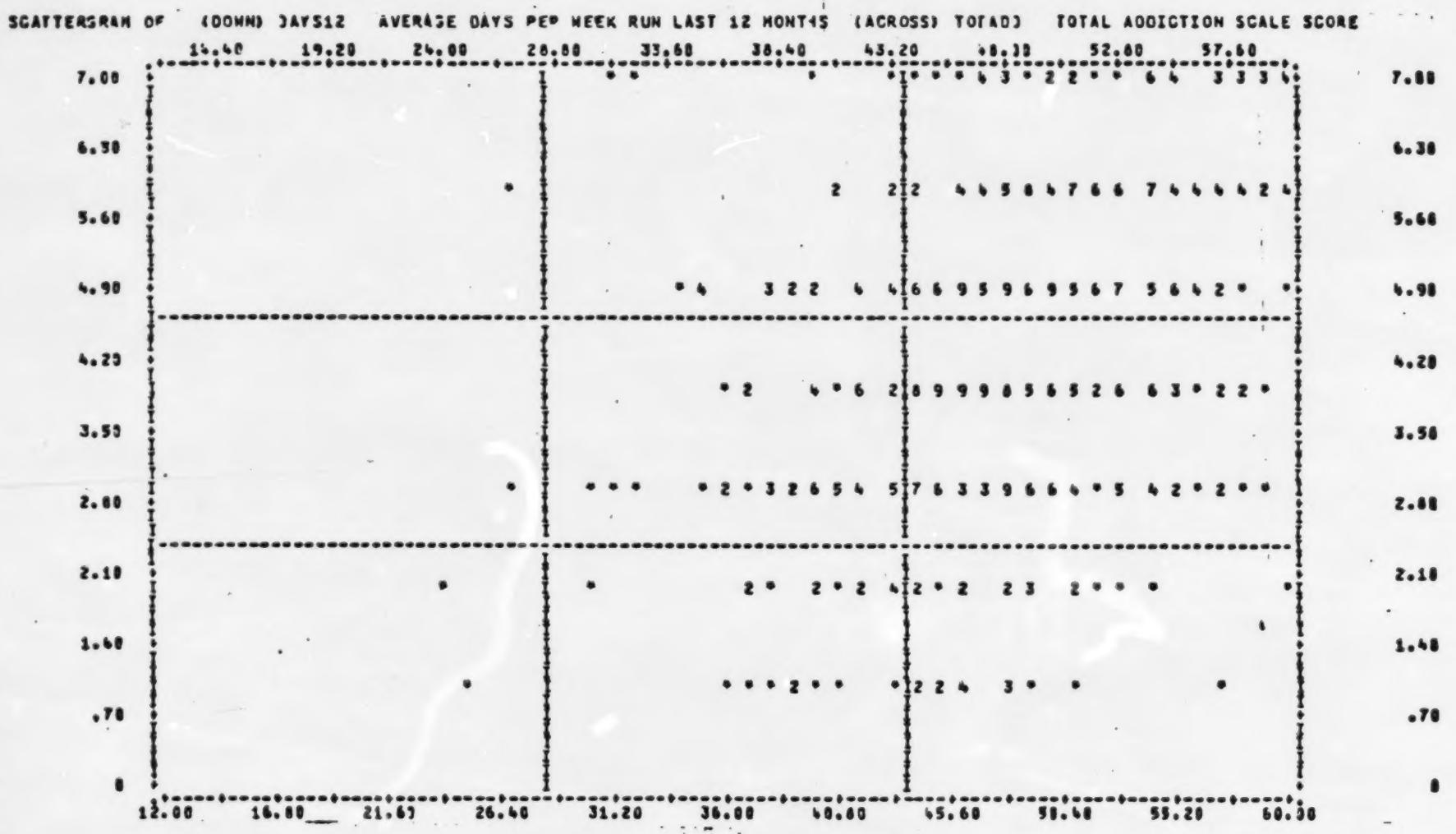

Figure 3. Relationship between total dependence score and average days per week run in the past 12 months for regular runners.